

CLAIMS

1. A fuel cell formed by stacking an electrolyte
electrode assembly (12) and separators (13) alternately,
5 said electrolyte electrode assembly (12) including a pair of
electrodes (28, 30) and an electrolyte (26) interposed
between said electrodes (28, 30),

wherein a reactant gas supply passage (20a) and a
reactant gas discharge passage (20b) extend through said
10 fuel cell in a stacking direction of said fuel cell;

a reactant gas flow field (32) is formed for supplying
a reactant gas along an electrode surface;

said reactant gas flow field (32) includes a plurality
of serpentine flow grooves (38a) having substantially the
15 same length, said serpentine flow grooves (38a) including an
even number of turn regions formed on a surface of said
separator (13);

a substantially triangular inlet buffer (34) for
connecting said serpentine flow grooves (38a) and said
20 reactant gas supply passage (20a);

a substantially triangular outlet buffer (36) for
connecting said serpentine flow grooves (38a) and said
reactant gas discharge passage (20b); and

said inlet buffer (34) and said outlet buffer (36) are
25 formed substantially symmetrically with each other.

2. A fuel cell according to claim 1, wherein a

plurality of bosses (34a) are formed in at least one of said inlet buffer (34) and said outlet buffer (36).

5 3. A fuel cell according to claim 1, wherein each of said reactant gas supply passage (20a) and said reactant gas discharge passage (20b) has at least one oblique side (37a, 37b); and

10 said oblique side (37a) of said reactant gas supply passage (20a) faces an oblique section (34c) of said inlet buffer (34), and said oblique side (37b) of said reactant gas discharge passage (20b) faces an oblique section (36c) of said outlet buffer (36).

15 4. A fuel cell according to claim 1, wherein one side (34b) of said inlet buffer (34) and one side (36b) of said outlet buffer (36) are substantially perpendicular to terminal portions of said serpentine flow grooves (38a).

20 5. A fuel cell according to claim 1, wherein said reactant gas supply passage includes a fuel gas supply passage (24a) and an oxygen-containing gas supply passage (20a), and said reactant gas discharge passage includes a fuel gas discharge passage (24a) and an oxygen-containing gas discharge passage (20b); and

25 among six passages comprising said fuel gas supply passage (24a), said oxygen-containing gas supply passage (20a), said coolant supply passage (22a), said fuel gas

discharge passage (24b), said oxygen-containing gas discharge passage (20b), and the coolant discharge passage (22b), three passages extend through a left end of said separator (13), and the other three passages extend through a right end of said separator (13).

6. A fuel cell formed by stacking an electrolyte electrode assembly (12) and metal separators (13) alternately, said electrolyte electrode assembly (12) including a pair of electrodes (28, 30) and an electrolyte (26) interposed between said electrodes (28, 30),

wherein a reactant gas supply passage (20a) and a coolant passage (22a) extend through said fuel cell in a stacking direction of said fuel cell;

a reactant gas flow field (32) is formed on one surface of said metal separator (13) for supplying a reactant gas along an electrode surface, and a coolant flow field (42) is formed on the other surface of said metal separator (13) for supplying a coolant along the other surface of said metal separator (13);

said metal separator (13) includes a substantially triangular buffer (34, 46); and

said buffer (34, 46) has one side connected to said reactant gas supply passage (20a) on said one surface of said metal separator (13), and another side connected to said coolant passage (22a) on said other side of said metal separator (13), and a still another side connected to said

reactant gas flow field (32) and said coolant flow field (42) on both surfaces of said metal separator (13).

5 7. A fuel cell according to claim 6, wherein said reactant flow field (32) includes a flow groove having a curve.

10 8. A fuel cell according to claim 6, wherein said metal separator (13) includes first and second metal plates (14, 16) which are stacked together;

15 said first metal plate (14) has said reactant gas flow field (32) on a surface opposite to said second metal plate (16), and said coolant flow field (42) is formed between said first metal plate (14) and said second metal plate (16); and

20 a substantially rectangular buffer (34) formed on said first metal plate (14), and a substantially rectangular buffer (46) formed on said second metal plate (16) are at least partially overlapped with each other in said stacking direction.

 9. A fuel cell according to claim 6, wherein said reactant gas supply passage (22a) has at least one oblique side (37a); and

25 said oblique side (37a) of said reactant gas passage (22a) faces an oblique section (34c) of said buffer (34).

10. A fuel cell according to claim 6, wherein one side (34b) of said buffer (34) is substantially perpendicular to a terminal portion of said reactant gas flow field (32).

5 11. A fuel cell according to claim 6, wherein said reactant gas passage includes a fuel gas supply passage (24a), an oxygen-containing gas supply passage (20a), a fuel gas discharge passage (24b) and an oxygen-containing gas discharge passage (20b), and said coolant passage includes a
10 coolant supply passage (22a) and a coolant discharge passage (22b); and

among six passages comprising said fuel gas supply passage (24a), said oxygen-containing gas supply passage (20a), said coolant supply passage (22a), said fuel gas
15 discharge passage (24b), said oxygen-containing gas discharge passage (20b), and the coolant discharge passage (22b), three passages extend through left ends of said first and second metal plates (14, 16), and the other three
20 passages extend through right ends of said first and second metal plates (14, 16).